

2019 Performance Report and Monitoring and Assessment Review

Emission Trends and Significant Events

During reporting period 01 January to 31 December 2019, it can be demonstrated by the data recorded by the CEMS and Envirosoft system that air emissions from the two operating units (Unit 10: LCP 234 and Unit 20: LCP 235) were in line with the operational regimes. During the same operating period it can be observed that there were no unaccountable variations.

Both Unit 10 and Unit 20 were run through the year, except for a planned maintenance outage on Unit 10 in August.

Emission to Air Envirosoft System Data Review

Introduction

In accordance with previous annual reporting requirements, nitrous oxide (NOx) emissions data charts are detailed in appendix 1 and 2 for Unit 10:LCP 234 and Unit 20: LCP235 respectively. These graphs detail the quarterly emissions over the 2019 reporting year.

- NOx output in mgNm^{-3} is represented in orange and the y axis scale concentration in mgm^{-3} .
- MW unit load is depicted as a dark blue line.

Review

Data reported in quarterly IED CON2 forms and detailed in the quarterly trends in appendix 1 and 2 demonstrate that there were no emissions limit value exceedances for either Units 10 or Unit 20 whilst in operation for the reporting period. A false peak reading can be observed for Unit 20 on 03 July 2019 when the unit was not in operation and off-load. This was due to a temporary fault on the CEMS unit which was immediately rectified.

The quarterly emissions data for both Units 10 and 20 demonstrate a continuous emission trend of NOx emissions below 50 mgNm^{-3} , with a strong correlation between load (MW) and NOx emissions. Throughout the year, both operating units continued to be operated in accordance with instructions from National Grid, the exception being the planned outage in August for Unit 10. Severn Power Station continues to be used mainly to meet peak power demand with frequent starts for both units.

As part of the normal CEMS equipment operations, there are regular periods where the equipment is subject to automated recalibration. The autocalibration process, in general, takes place without anomalous readings. From the quarterly data trends for Units 10 and 20, appendix 1 and 2 respectively, no anomalous readings were observed during autocalibration events in the 2019 reporting period.

The CEMS is also subject to planned and unplanned maintenance, examples of such activities are presented in appendix 4.

Emissions to Water Review

Emissions to water are subject to automated pH monitoring which is calibrated in accordance with the quality control process. The accuracy of the probes is therefore assured in the same way as for all other process-critical measurement systems on site. Written protocols for calibration and maintenance are in place and continue to be followed.

In addition to automated pH monitoring, manual samples are taken, and pH recorded as a backup reading.

As in previous years, the processes which we are required to sample are batch discharges. Discharge does not occur unless the water has been tested and found to be within pH limits.

Environmental Permit Compliance: Other Significant Events

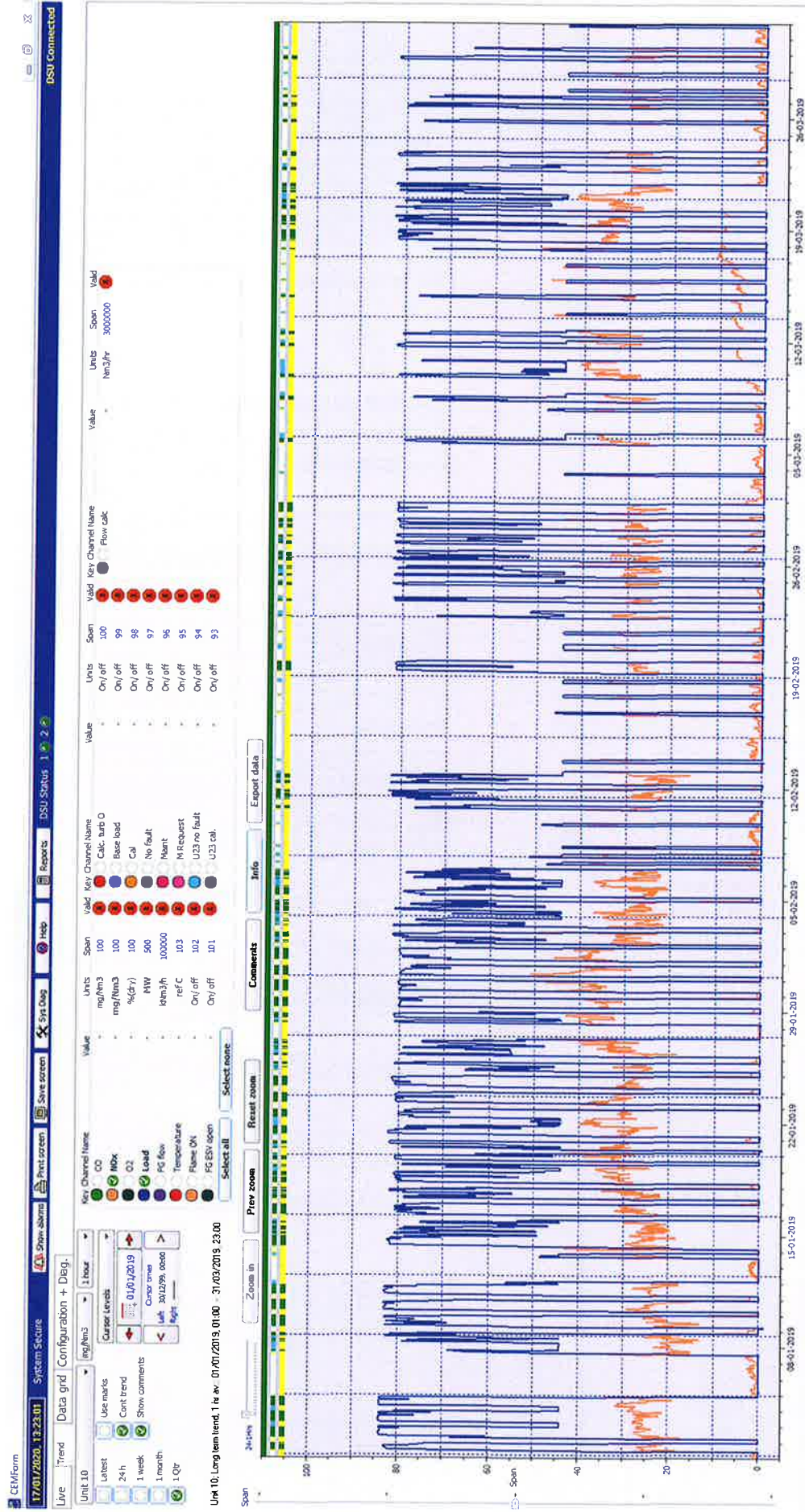
- Reports were compiled and submitted to NRW in accordance with the installation Permit in January, April, July and October.
- Annual 'PR-TR' online reporting of emissions and waste for the site was prepared and submitted to NRW in March in accordance with regulatory requirements.
- The Annual Surveillance Test (AST) for both of our Continuous Environmental Monitoring Systems (CEMS), was undertaken in June.
- All calibration functions in the CEMS met the acceptance criteria for an AST and as such the systems were confirmed as being suitable for continued use.
- The AST sampling contractors have previously recommended that we continue to monitor the performance of our two NO_x converters, which are part of the CEMS processes. The NO_x converters are replaced very 6 months which is greater than the manufacturer recommended frequency of every 12 months.

Community Engagement and Complaints

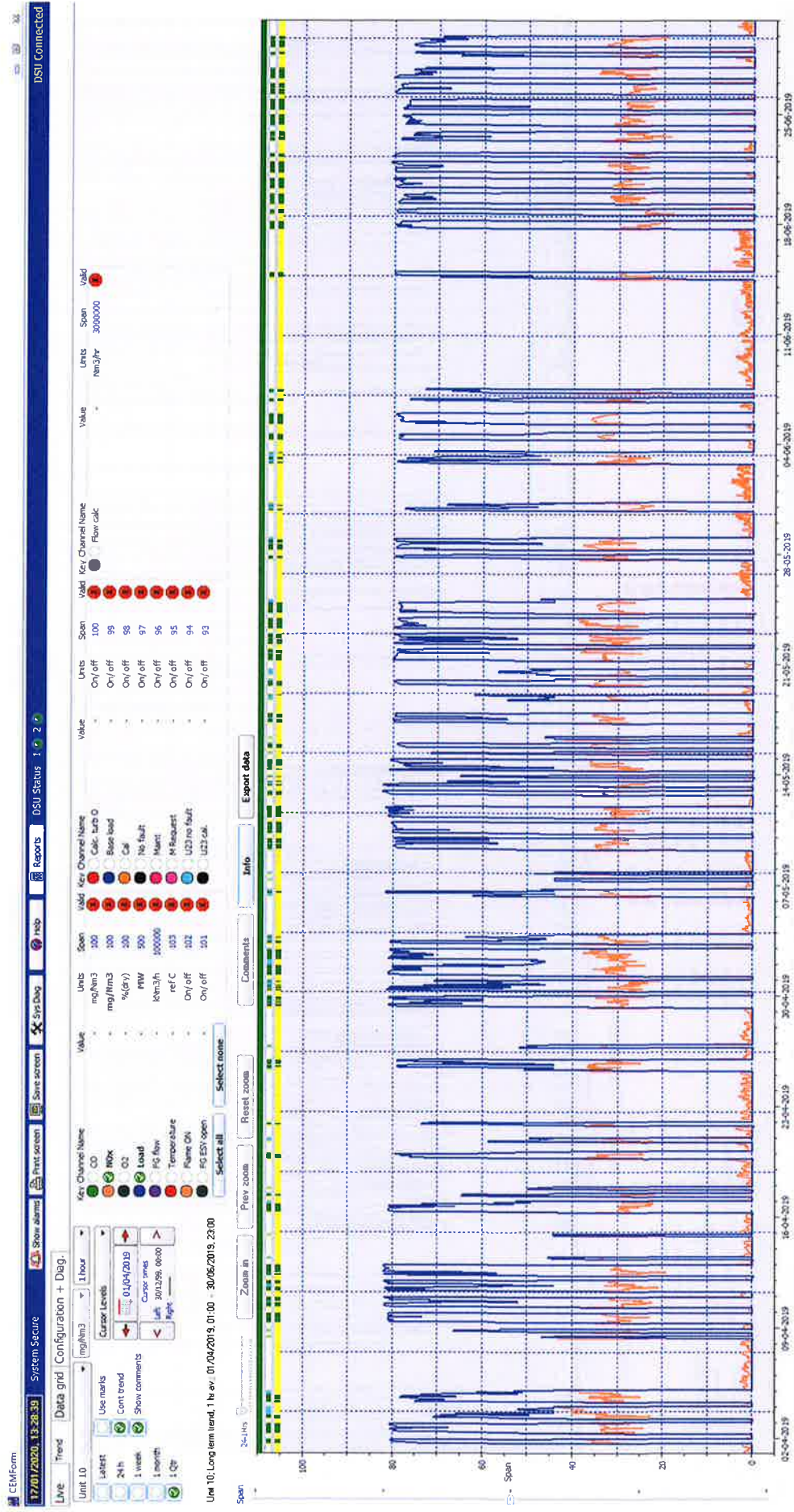
No environmental queries or complaints were received during the 2019 reporting period. Calon Energy continue to engage with the local community with stakeholder meetings which are supported by Siemens.

Appendix 1: Unit 10 (LCP234) 2019 CEMS Quarterly Trends

Q1 Unit 10 NOx



Q2 Unit 10 NOx



Q3 Unit 10 NOx

Unit 10 Configuration + Diag.

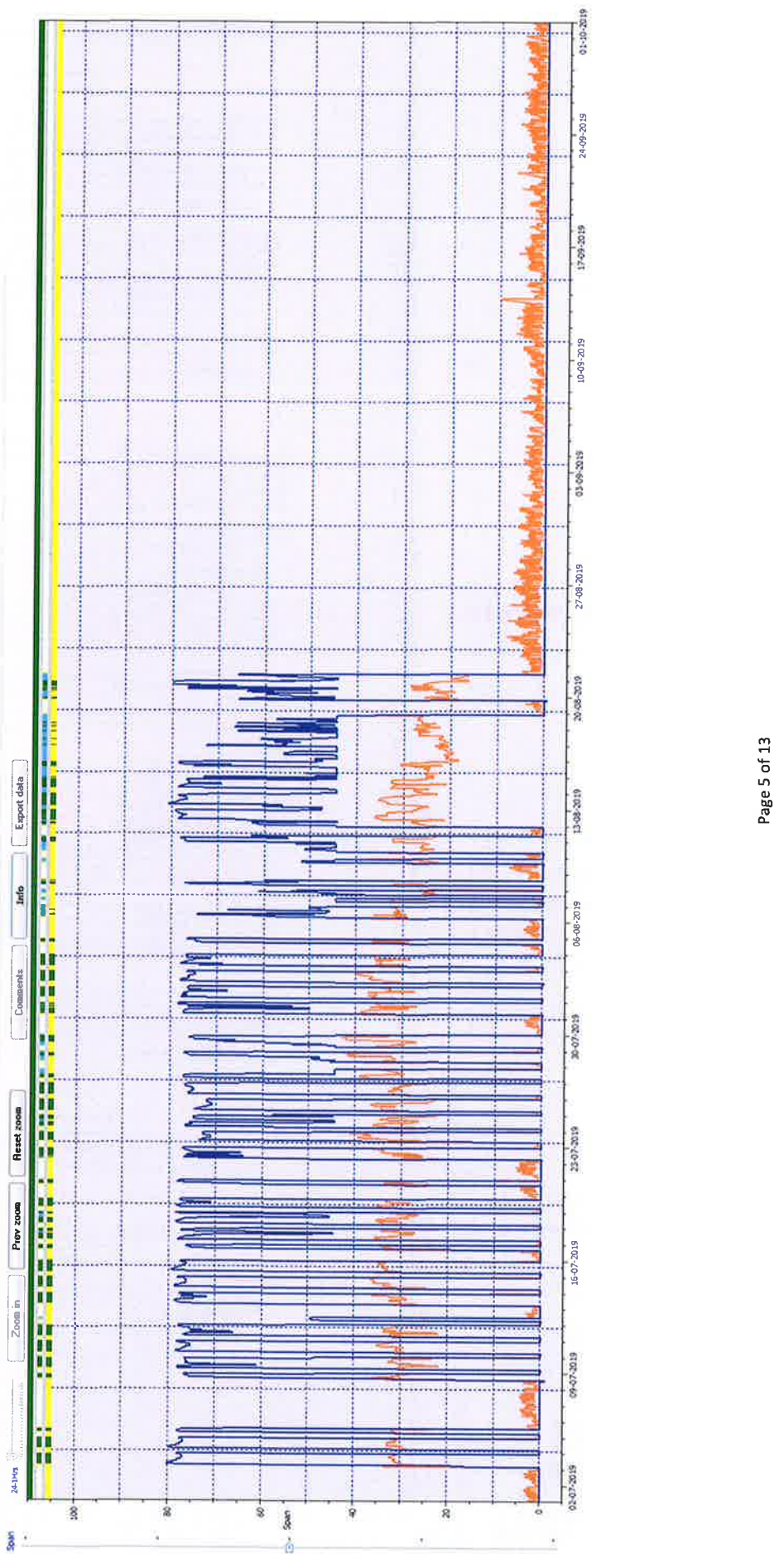
Unit 10: mg/m3, 1 hour, mg/m3, 1 hour, 01/07/2019, 30:12:59, 6000

Use marks: 24h, 1 week, 1 month, 1 Qtr

Unit 10 Key Channel Name: Calc. turb O, Basic load, Cal, No fault, Mant, M Request, U23 no fault, U23 cal.

Key Channel Name	Value	Units	Span	Valid	Key Channel Name	Value	Units	Span	Valid
CO		mg/m3	100	On/off	Flow calc		Nm3/hr	3000000	On/off
NOx		mg/m3	100	On/off					
O2		%(dry)	100	On/off					
Lead		MW	500	On/off					
FG flow		kNm3/h	100000	On/off					
Temperature		ref C	103	On/off					
Flame On		On/off	102	On/off					
FG Est. open		On/off	101	On/off					

Unit 20 Long term trend, 1 hr av., 01/07/2019, 01:00 - 30/09/2019, 23:00



Q4 Unit 10 NOx

System Secure 17/01/2020 13:30:18 DSU Connected

Live Trend Data grid Configuration + Diag

Unit 10 mg/m³ 1 hour

Latest 24h 1 week 1 month 1 Qtr

Use marks Cont trend Show comments

Cursor Levels 01/10/2019

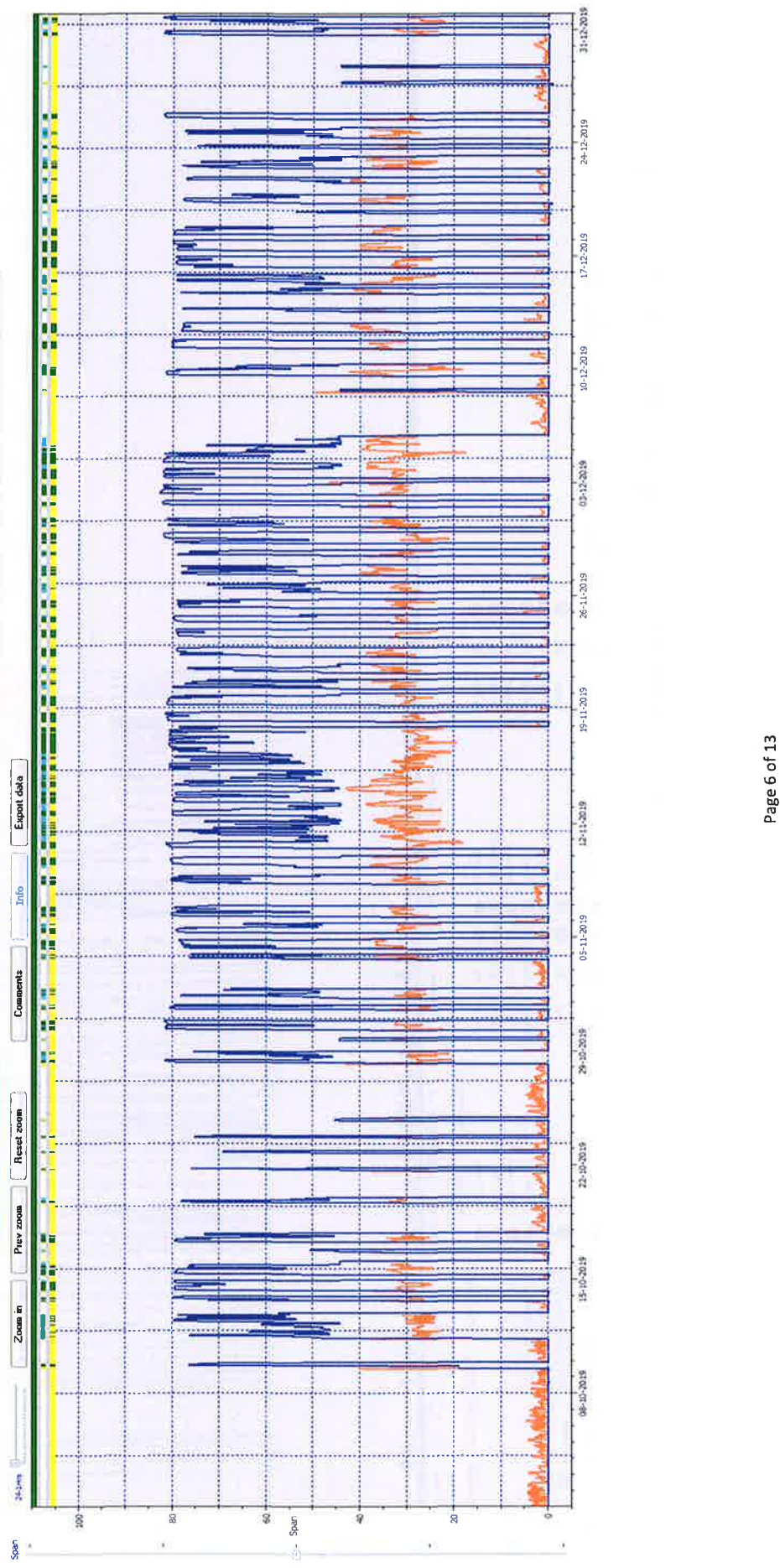
Cursor times Left: 30/12/99 00:00 Right

Unit 10: Long term trend, 1 hr av.: 01/10/2019 01:00 - 31/12/2019 23:00

Key Channel Name	Valid	Span	Units	Value	Key Channel Name	Valid	Span	Units	Value
CO	<input checked="" type="checkbox"/>	100	mg/m ³	-	Calc. turbo O	<input checked="" type="checkbox"/>	100	On/ off	-
NOx	<input checked="" type="checkbox"/>	100	mg/m ³	-	Base load	<input checked="" type="checkbox"/>	99	On/ off	-
O ₂	<input checked="" type="checkbox"/>	100	%(dry)	-	Cal	<input checked="" type="checkbox"/>	98	On/ off	-
Load	<input checked="" type="checkbox"/>	500	MW	-	No fault	<input checked="" type="checkbox"/>	97	On/ off	-
FG flow	<input checked="" type="checkbox"/>	100000	kWh/h	-	Maint	<input checked="" type="checkbox"/>	96	On/ off	-
Temperature	<input checked="" type="checkbox"/>	103	ref C	-	M Request	<input checked="" type="checkbox"/>	95	On/ off	-
Flame ON	<input checked="" type="checkbox"/>	102	On/ off	-	U23 no fault	<input checked="" type="checkbox"/>	94	On/ off	-
FG ESV open	<input checked="" type="checkbox"/>	101	On/ off	-	U23 cal	<input checked="" type="checkbox"/>	93	On/ off	-

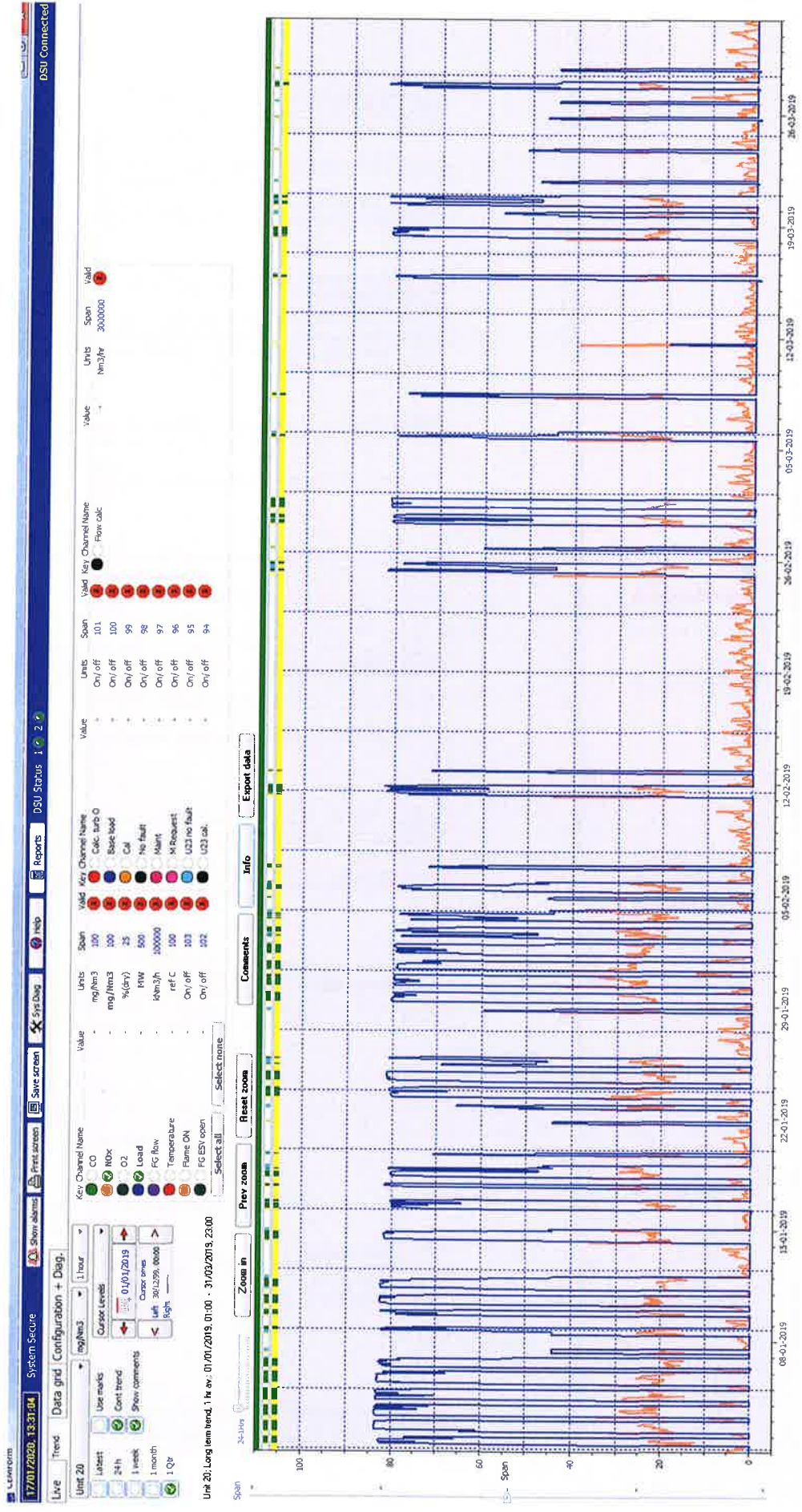
Units Nm³/hr Value 3000000 Valid

Key Channel Name Flow Calc

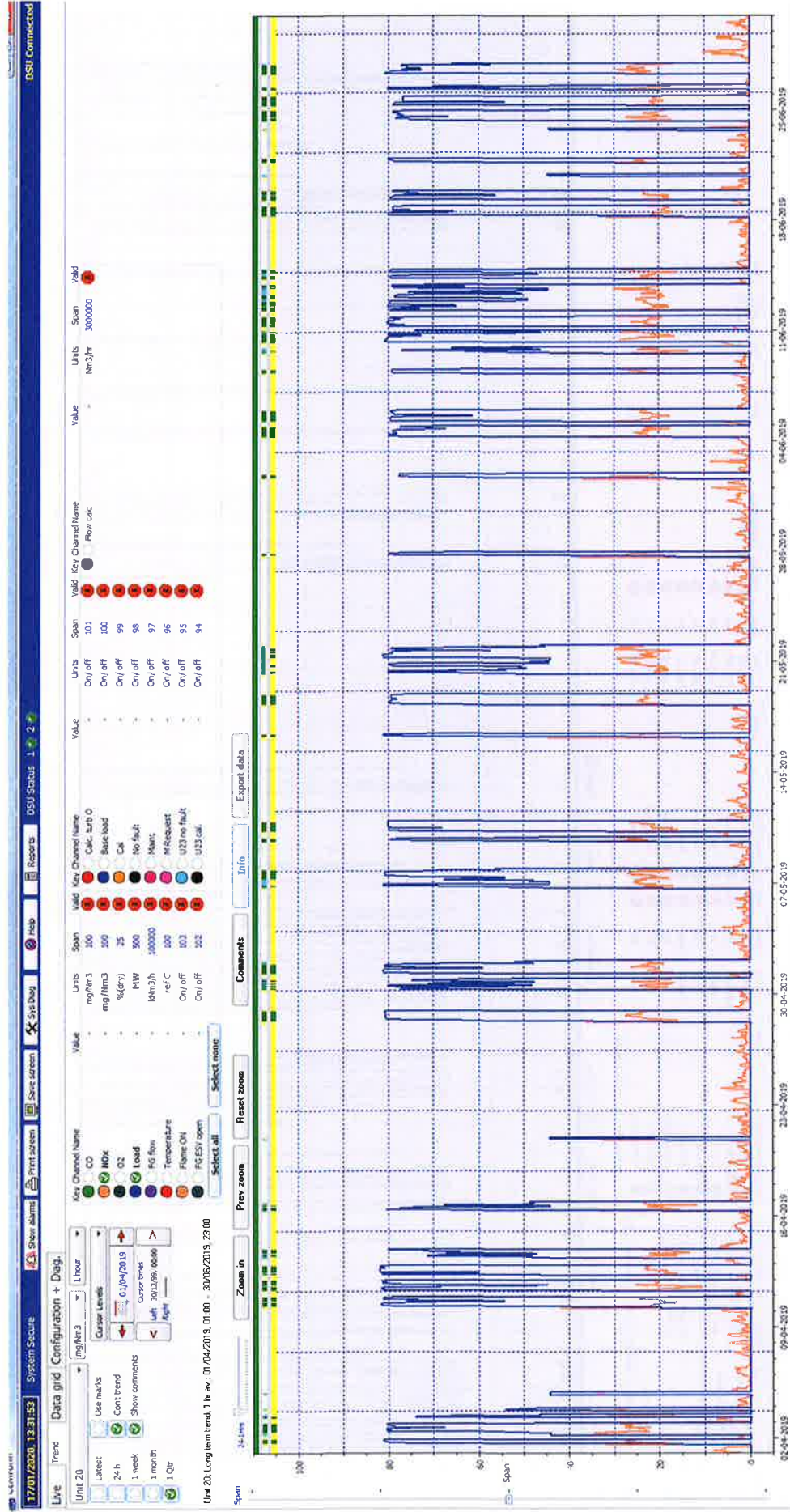


Appendix 2: Unit 20 (LCP235) 2019 CEMS Quarterly Trends

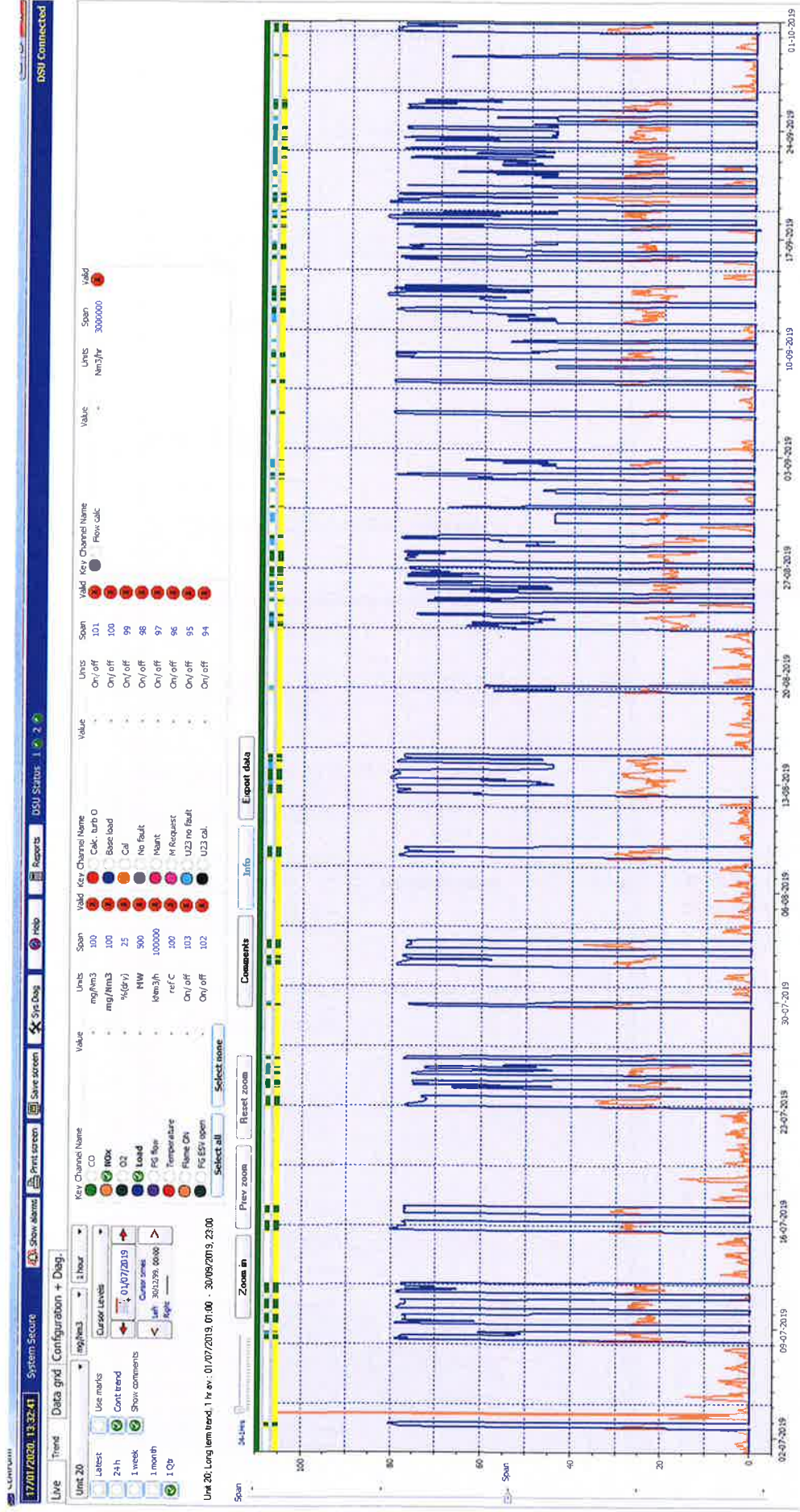
Q1 Unit 20 NOx



Q2 Unit 20 NOx



Q3 Unit 20 NOx



Appendix 3: 2019 Calibration Peak Reading due to Autocalibration Event

No events observed.

Appendix 4: Proactive and Reactive CEMS Maintenance Examples

Example of Proactive Maintenance

SIEMENS

SEVERN POWER
O&M Form No: EF-06.007-01
Rev. 6

15 day CEMS Maintenance Checklist

Work Order: 1620 Unit: 10 Date: 19/12/2019

Gas Calibration Bottle Information:					
Gas Calibration Data			Test Gas Certified Values		
Cylinder ID Number	163264		Gas	ppm	mg/m ³
Certification Type			CO	101.2	126.5
Certification Date	28-Oct-2015		NO	94.6	126.764
Certification Expiry	27-Oct-2020				
Analyzer Information:					
Manufacturer	Model	Meas Components		Serial Number	
Siemens	Ultramat 23	CO/NO/CO2		7MB2337-4AU10-PT1-Z	
Calibration Information:					
Component	ZERO (after AUTO CAL)	MEAS VALUE (before CAL)	MEAS VALUE (after CAL) (A)	Test Gas Certified Value (B)	Span Error (%) (C) <small>See Note 1, 2</small>
CO (mg/m ³)	0	128.5	126.5	126.5	0
NO (mg/m ³)	0	128	128	126.8	0.94637224
System General Check					
Cabinet Visual Inspection:	OK		Cabinet Fans/Filter/Heater Status:	OK	
Line 1 Flow (Vh):	OK		Filter Status (B4 and KT2):	OK	
Line 2 Flow (Vh):	OK		O ₂ Sensor Voltage (mV):	9.59	
<small>Notes:</small> (1) If span error is greater than 2% following calibration then calibration should be considered failed and should be repeated. (2) C = (A-B) * 100/B (3) Topm CO = 1.25mg/m ³ (4) Topm NO = 1.54mg/m ³					
Remarks:					

Non-Conformance reported with FN No. _____ / _____ (year)

Inspector: DW 19/12/19

